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Faculty and Librarians' Partnership: Designing a New Framework to Develop Information Fluent Future Doctors

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ABSTRACT

Upon faculty request, information literacy instruction was fully integrated into an English for Academic Purposes course for non-native English speaking students pursuing a medical degree at a U.S. institution in the Gulf State of Qatar. Adopting the flipped classroom modality, librarians designed modules to meet the students' information literacy needs while adapting the content to the course syllabus. Content was uploaded to the learning management system, Canvas. Readings, online tutorials, quizzes and assignments were created to achieve the outcomes of each session. Completion of information literacy modules is factored in the overall grades of students in the English for Academic Purposes course. This paper will outline the design, implementation, and assessment of information literacy sessions and will highlight the importance of collaboration between faculty and librarians to set a common ground and reach expected outcomes. It will also share the students' perceptions of the effectiveness of integrating information literacy in an English for Academic Purposes course.

INTRODUCTION

In its framework for 21st century learning, the Partnership for 21st Century Skills (2015) established information literacy (IL) as a fundamental component of student success in the global economy. Additionally, with increased student mobility and a thriving transnational education, learning English as a Second Language (ESL) is still regarded as an essential component of an effective academic and career readiness to succeed in a knowledge-based economy. Putting these two pieces together, the present study sought to explore the efficacy of combining IL skills with an English for Academic Purposes (EAP) course for non-native English speaking first-year college students to reach a level of information fluency.

PURPOSE OF THE STUDY

The aim of the study was to examine first-year Arab students' experience with integrating IL skills instruction in the curriculum of an EAP course at a pre-medical program of a U.S. private college in the Gulf State of Qatar.

TERMINOLOGY

This study uses the terms English as a Second Language (ESL) and English for Academic Purposes (EAP) interchangeably.

RESEARCH QUESTIONS

- R1: What were the IL needs of newly-graduated high school EAP Arab students enrolled in a first-year premedical program at a U.S. private college?
- R2: How effective were the IL modules in improving students' research skills as established by the Association of College and Research Libraries (ACRL)'s five standards?
- R3: What were the study participants' perceptions of the IL content as part of the EAP curriculum?

LITERATURE REVIEW

LIBRARIANS AND FACULTY COLLABORATION

IL skills are deep-rooted in higher education. The Middle State Commission on Higher Education (2009) describes the relationship among general education skills as inherent and intrinsic and states that "the interrelatedness is evident in the concept of "information literacy", which embraces all of the specific general education skills" (p. 47).

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Furthermore, Calkins and Kelley (2007) reported that students' search of the literature typically lacks rigor, and they are prone to selecting the first few references they find, regardless of quality or relevance to the topic. Moreover, undergraduates often select online sources but have difficulty assessing the credibility of the sources.

Faculty and librarians both recognize the lack of IL skills among college students. Bowles-Terry, Davis, & Holliday (2008) identify librarians and writing instructors as "longtime allies that share the goal of teaching information literacy." Through collaboration, librarians become more visible and accessible. Students can identify, relate to, and easily approach librarians for help. Dhawan and Chen (2014) believe a learning community can be created and "students form bonds" (p. 417) by linking the content of the two courses and working closely with faculty and librarians.

In many institutions, IL instruction is offered as a single standalone lecture. Pedagogically, this is not ideal as generally many of the tools and concepts covered in IL presentations are not used by the students until much later in the semester, increasing the likelihood that the information will be forgotten or remembered incorrectly. To overcome this challenge, McCue (2014) suggests that librarians need to create effective partnerships and build strong working relationships with faculty members responsible for the development of curricula in courses where IL instruction is present or potentially included. McCue (2014) also points out that research into IL and Blended Learning is in an early stage with the current body of knowledge consisting of case studies and small action-based research projects.

Moselen and Wang (2014) describe a systematic model for integrating IL into an undergraduate program developed by Li Wang at the University of Auckland. This model defines three key elements: the *What*, *Who* and *How*. While the *What* element includes the expected outcomes and the *How* element describes the method used for integration and contextualization, the *Who* element highlights the notion of collaboration between librarians and faculty as main stakeholders. The authors found that "good professional relationships with academic staff... would enable collaboration." However, some librarians participating in the study observed that a lack of confidence and a lack of knowledge of the curriculum prevented them from approaching faculty. Other librarians pointed out that faculty hesitated to ask for their help as they "did not really know what subject librarians could do to help them" (Moselen & Wang, 2014, p. 118).

INTEGRATING IL USING THE FLIPPED CLASSROOM MODALITY

While some literature supports teaching general principles that can be applied to different contexts (Bruner, 2009), other studies found that course-integrated instructions are more beneficial as they encourage critical thinking and information evaluation rather than generic information retrieval skills (Dhawan & Chen, 2014). Getting students "to apply, synthesize, question, understand, and communicate" is described as the main challenge that librarians and faculty are facing (Bowles-Terry, Davis, & Holliday, 2008), as students usually concentrate on the assignment requirements rather than explore the topic in depth and critically evaluate sources.

In an article published in 2008 comparing e-learning to lectures, Reime et al. describe e-learning as a teaching method that uses information technology to develop, deliver and facilitate the learning process (Reime, Harris, Aksnes, & Mikkelsen, 2008, p. 799). Technology is redefining instruction, and Learning Management Systems (LMSs) are being used more to deliver e-learning in college settings. "Young students, taking an online course is not a novel experience… [They] are usually comfortable with the technology as well as a student-centered learning environment" (Jackson, 2014, p. 468).

The flipped classroom concept is being increasingly used to deliver instruction in an online environment. Youngkin (2014) describes the flipped classroom as "an inverted model of teaching that often uses various communication or instructional technologies" (p. 368). Students can do the reading, watch video tutorials and submit quizzes outside the classroom, while in-class time is used for activities, discussion and assessment. The flipped classroom emphasizes the responsibility of individual learners in reviewing and absorbing teaching material on their own rather than relying on the instructor to explain the content. It creates "a more personalized academic experience" (Youngkin, 2014, p. 369). Dhawan and Chen (2014) see the flipped classroom as an opportunity for librarians "to teach IL with some depth" while allowing students to have more time to process IL instruction. Assessment can be built-in for short-term as well as long-term goals. Quizzes, assignments, discussions and surveys can be designed and delivered using a LMS.

Arnold-Garza (2014) describes how librarians used the flipped-classroom model to successfully teach course-integrated IL sessions at Albert S. Cook Library at Towson University. Pre-library session assignments included guides, brief video tutorials, and a quiz to test students' understanding of the material. Among the topics covered were scholarly and popular sources, database search, navigating the library website, and other information related tasks. In class, hands-on activities were administered "to apply the concepts introduced by the pre-library session assignment" (Arnold-Garza, 2014, p. 11). Based on the survey results, Arnold-Garza (2014) reported that 90% of 148 students found the online materials helpful and completed the pre-library meeting assignments prior to coming to class. The authors further reported that 86% of students commented that the face-to-face meetings were important to solidify their acquisition of the literacy skills presented via the flipped modality.

Utilizing the flipped modality along with the integration of IL into an established academic course is a new concept for literacy skills instruction and has limited representation in available literature.

FIRST YEAR ESL COLLEGE STUDENTS

In the United States, many institutions are striving towards improving first year college transition as it is considered very important for students to acquire needed skills such as time management, effective study habits, research skills and critical thinking for a successful academic experience. Dhawan and Chen (2014) asserted that first year college is an important part of a national conversation in higher education. In her article entitled "Empowering ESL students," Conteh-Morgan (2001) believes IL and ESL have "overlapping theories, objectives, and practices" (p. 31). She further explains that by teaming up with faculty, librarians are given the chance to align IL instruction with the course content and make its integration into an ESL course or program an easy task.

Many authors describe the integration of research skills into a specific course as the most effective method to successfully teach IL skills (Bowles-Terry, Hensley, & Hinchliffe, 2010; LaGuardia, 2011). It is crucial for students to put into practice these skills in a defined context to achieve specific learning outcomes. Herring (2014) describes a successful collaboration at Ohio State University between a subject librarian and an ESL instructor to strengthen "an established ESL composition course" (p. 128). In a culturally-diverse environment where students' backgrounds vary enormously, some concepts related to the use of scholarly materials, citations and plagiarism are challenging to transmit. A purposeful collaboration between librarians and faculty makes the teaching and reinforcing of such concepts a less difficult task.

There are online tutorials available for teaching purposes. However, because students come from different cultural backgrounds, they have specific needs that cannot be covered by ready-made tutorials. In a study administered at Zayed University in the United Arab Emirates

(UAE), Martin, Birks, and Hunt (2010) found that "most tutorials existing worldwide were considered too text heavy, the language too complex, or the examples used […] were culturally inappropriate" (p. 70).

In her study of 30 female English as a Foreign Language students in the UAE, Johnston, Partridge, and Hughes (2014) encountered multiple challenges that affected her students' IL experience. First, students' English language abilities had an impact on reading information in English, accessing information in their local environment and language, and translating information to make sense of it. Johnston also found that students utilized teacher-directed techniques to read, understand, and organize information.

Faculty–librarians' collaboration in delivering IL is well documented in the research literature. However, with the advent of the flipped classroom modality as an innovative content delivery model, studies that examine its effectiveness in an ESL course that integrates IL skills are rare, especially in a classroom of Arabic speaking students pursuing a medical degree. Hence, this research aimed to fill this gap and provide some insight into the strategies utilized in the design and implementation of the IL curriculum embedded in the ESL course. The study also investigated students' perceptions of the effectiveness of this integration.

INSTITUTIONAL CONTEXT

Supporting the mission of Weill Cornell Medical College in Qatar (WCMC-Q), the Distributed eLibrary's (DeLib) mission is to deliver diverse information resources and services that engage students, faculty and staff of WCMC-Q, as well as local, regional, and international communities. In alignment with its mission, a goal in DeLib's strategic plan is to build a progressive and academically robust information literacy program that supports lifelong learning. DeLib's strategic plan charts the future for information resources and services at Weill Cornell Medical College in Qatar (WCMC-Q) and the Library's role in supporting the biomedical community in the areas of teaching, clinical care, research, and service as well as its wider role in the region and beyond. The DeLib IL plan was designed in accordance with this strategic plan. To provide effective IL instruction to WCMC-Q's users, the DeLib instruction program set two goals. First, it aimed to ensure all students had IL skills to the extent required by their programs/careers, and second to ensure that skills were grounded in real need, practiced over time, and taught in a sequential manner to build knowledge and skills without unnecessary redundancy.

Researching available educational literacy models, we found several that could inspire our needs. Examples of these models include The Big6 (Eisenberg and Berkowitz, 1990), Information Search Process (Kuhlthau, 1989), Stripling and Pitts Research Process Model (1988), Pathways to Knowledge Information Skills Model (Pappas and Tepe, 1997), The SCONUL Seven Pillars of Information Literacy Core Model For Higher Education (Society of College, National,, & University Libraries, 1999), the Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education (American Library Association, 2006), and others.

After careful analysis of these various models, DeLib decided to adopt the Association of College and Research Libraries (ACRL)'s IL Competency Standards for Higher Education as a model for its instruction program for premedical and medical students. We chose this model because it was more closely aligned with our current approach to IL instruction, as well as specifically targeting libraries in higher education. As the ACRL is the largest division of the American Library Association (ALA) and WCMC-Q is an American educational institution, it seemed an appropriate partnership.

The ACRL IL Competency Standards model is comprised of five standards that outline specific performance indicators and outcomes. The five ACRL IL Competency Standards (American Library Association, 2006) define the information literate student as being able to:

- S1: determine the nature and extent of the information needed.
- S2: access needed information effectively and efficiently.
- S3: evaluate information and its sources critically and incorporate selected information into his or her knowledge base and value system.
- S4: use information effectively to accomplish a specific purpose.
- S5: understand many of the economic, legal, and social issues surrounding the use of information, access and use information ethically and legally.

To determine our current position, DeLib conducted a curriculum mapping — an analysis of course content to look for the best places and methods to ensure that all students attain the information knowledge and skills needed to progress throughout their education and into their careers. The library instruction coordinator created a list of courses where librarians had been invited to provide instruction. Topics taught in those sessions were aligned to the ACRL IL Standards. This provided librarians with a visual aid in determining the gaps in their IL program (see Appendix A Table A.1) and helped as a basis to develop a new detailed logic model that would fill these gaps and align the IL sessions' content to the EAP course content (see Appendix A, Table A.2).

MATERIALS AND METHODS

The study aimed to inquire about the effectiveness of delivering IL skills content through an EAP course using online tools. The purpose of this study was to assess the IL needs of newly-graduated high school EAP Arab students enrolled in a first-year premedical program at a U.S. private college; to evaluate the effectiveness of IL modules in improving students' research skills as established by the ACRL's IL standards; and to explore first-year college students' attitudes towards the integration of IL skills in an ESL curriculum using the flipped classroom pedagogical model.

The study utilized seven different data collection tools including a needs analysis, quizzes and assignments, search logs, two exit tests referred to as "English for Academic Purposes-Information Literacy" (EAPIL), a survey and focus groups. Qualitative and quantitative methods provided complementary, valid and reliable results.

A needs analysis was first administered at the beginning of the academic year. Ten structured, closed, multiple-choice questions were uploaded in Canvas to measure the initial IL skills of the study participants and provided the basis of this study. Although some consider that administering structured questions forces participants to choose an answer rather than being genuine and deliver their own interpretation of a subject, it was decided to have fixed responses as it would help reach the main purpose of these sessions and cover the IL skills in question. Every question included an additional field for "I don't know" to prevent participants from trying to guess the right answer and thus alter the results. The questions covered the five standards of IL set by ACRL (see Appendix C).

Then all modules included quizzes and/or assignments to assess the students' understanding of the covered topics. These can range from three simple questions to more elaborate assignments where students had to submit an annotated bibliography, describe a search on one of the databases, upload an evaluation sheet for websites, and submit an interlibrary loan request through ILLiad, the DeLib's resource sharing management software. While quizzes were automatically graded, and students received immediate feedback, the assignments had to be graded by librarians and comments were added when necessary. All quizzes and assignments were administered through Canvas and constituted 10% of the EAP total grade for the first semester and 5% for the second semester.

Search logs were used as a method to document students' search strategies. Students were introduced to search log during IL Module 2/Session 2 and were requested to submit it with every essay they turned in for their EAP course. The search log was designed to help students keep track of the search techniques, relevant keywords and databases utilized, limits and filters applied as well as citations of the most pertinent sources found. Through the use of search logs, the librarians' objective was that students would rethink their search strategies, use all search techniques covered during the sessions and practice creating citations. In order to encourage its use, faculty required students to turn in a search log with every essay.

At the end of the first and second semesters, students had to take the same 50-question exit test made up of multiple-choice and true/false questions. Although the test was not graded for the fall semester as some of the skills were not introduced yet to students, it had three main objectives: first, to identify gaps in the sessions delivered during the fall semester; second, to plan new IL sessions for the spring semester; and third, to compare students' skills after each semester. The five ACRL Standards were reflected with 10 questions per standard.

Focus groups have been used before as a means to evaluate IL instruction. In this study, focus groups were used to give the students a chance to voice their concerns, preferences and approaches regarding IL sessions. Young (1993) observed that the interaction between the researcher and participants is less formal and easier to administer in focus groups where "people tend to be less inhibited than in individual interviews" (p. 391). Focus groups took place at the end of the fall semester. Six questions were used as well as sub-questions to help reiterate and explain the initial ones and stimulate the discussion while keeping it aligned with the main purpose of the study. Participants were divided into three groups facilitated by the three researchers. Time varied between 20 and 30 min for each group. No recording device was used due to cultural sensitivity and participants' preference. Researchers took notes manually.

Finally, a five-minute survey was circulated to all students at the end of the first semester. The survey was used as another data collection tool along with the above-mentioned methods. A mix of closed and open-ended questions was designed to collect structured information. Questions addressed the value of IL sessions according to students, their level of confidence in using search techniques before and after the sessions, and the transferability of the skills learned. Students were also asked to report any confusing or unclear ideas and suggest ways to improve the sessions.

PARTICIPANTS

Participants in this research project were 18 first-year college students enrolled in an EAP course that aimed to improve non-native English speakers' reading comprehension, develop their academic vocabulary, and enhance their writing of college level essays that require the use of research skills. Students come from a variety of school systems such as the Qatari public system, an American Style high-school curriculum and the British system. 16 Qatari students, one Egyptian, and one Palestinian participated in the study, 12 of whom were females and six were males. Their first language was Arabic, but there were two students who also spoke Urdu and Kurdish. Their ages ranged between 17 and 19. In addition to their EAP course, students were enrolled in physics, chemistry, math, biology, and a global health seminar. English was the medium of instruction in all courses. During orientation, all students received a laptop and attended a training session on Canvas, the LMS adopted by the college. Although 21 students enrolled in the Foundation class, three students dropped the course before the beginning of the fall semester and one student dropped the course in the second semester, which brought down the number of participants to 18 in the fall semester and 17 in the spring semester.

STUDY RESULTS

RESEARCH QUESTION 1

R1: What were the IL needs of newly-graduated high school ESL Arab students enrolled in a first-year premedical program at a U.S. private college?

A needs analysis was designed and administered as a tool to measure students' skills prior to any session. Data were gathered from 10 questions to generate a logic model (see Appendix A, Table A.2) that helped in planning the content of each module and session. 18 students participated in this analysis, which consisted of 10 questions (see Appendix C).

The needs analysis yielded interesting results that shaped IL sessions' content and provided a targeted learning experience. Results of the needs analysis generated the following goals:

- Reinforce existing concepts by giving more hands-on activities and time for reflection, e.g. academic integrity, plagiarism, access to valuable information sources and search engines.
- Cover new concepts and provide real examples for better understanding and assimilation of new research skills, e.g. citation, Boolean operators, scholarly sources and evaluation of online resources.

During the fall semester, nine sessions were delivered to students in a class setting. Hands-on activities were designed to reinforce the learning experience of the students, engage them in class activities and encourage discussion. This course integration consisted of:

- Eight online modules created and uploaded into the EAP course in Canvas
- Nine weekly 50-min sessions
- Weekly quizzes and assignments
  One week prior to each session, module content was created in Canvas including readings, video tutorials, quizzes and assignments to be completed and submitted before class time. During in-class sessions, students were divided into groups of three and were given activities to prepare and share their findings by the end of the session with classmates and librarians. Quizzes, assignments and in-class activities were given 10% of the EAP total grade. Each module and session covered two to three outcomes such as academic integrity, different types of information sources, advanced search techniques, Discovery tool, plagiarism, citation, annotated bibliography, popular, scholarly and peer-reviewed publications, information evaluation, Google Scholar and interlibrary loan service (see Appendix B, Table B.1).

For the spring semester, five sessions were designed and delivered to students every other week in a class setting with hands-on activities, quizzes, assignments and class discussion. The spring semester course integration consisted of:

- Four online modules created and uploaded into the EAP course in Canvas
- Five 60-min sessions

Students' activities including quizzes, assignments and in-class participation were given 5% of the EAP total grade for the spring semester. Modules and sessions covered the following outcomes: find print materials, primary and secondary sources, APA citation style, using the citation management software RefWorks to create, export, and import citation and generate a bibliography (see Appendix B, Table B.2).

RESEARCH QUESTION 2

R2: How effective were the IL modules in improving students' research skills as per the ACRL's five standards?

Students' final scores on quizzes and assignments for the fall semester were between 72% and 95% for the IL component. In the spring semester, students scored between 78% and 90%.

To have an idea on the quality of references used in students' search logs and essays, students were expected to write five academic essays using scholarly and peer-reviewed references throughout the semester. In interviews conducted with students at the end of the semester, they reported more confidence in using databases and other search tools to locate sources that supported their ideas. Students also pointed out noticing improvement in using evidence from outside sources, which enhanced their writing quality and developed their background knowledge. Finally, the faculty member teaching the course affirmed students' perceptions and observed that students' essays demonstrated confident use of information retrieved from outside sources and remarkable progress in acquiring IL skills.

EAPIL tests results were used to assess students' competence as outlined by the ACRL standards.

STANDARD 1

Determining the information required, identifying key concepts and terms that describe the information need and recognizing that existing information can be combined with original thought, experimentation, and/or analysis to produce new information proved to be challenging to the students with an average score of 78%. However, this increased to 80% in the spring semester. As primary/secondary resources had not been covered in the first semester, it was understood to have had an impact. Only 16% responded correctly, while 44% responded correctly in the second semester (see S1-8 in Appendix D).

STANDARD 2

Results provided some alarmingly low scores, showing the instructors the students' areas of weaknesses. For example, in question S2-9 (see Appendix D), only 11% answered correctly, which was a concern to the instructors who used this information to include learning and activities. It was gratifying to note an increase to 81% on question 9 in the second semester and an overall score of 84% for standard 2. Students showed more confidence in their search techniques. They performed better searches using Booleans, keywords, truncation and synonyms and were able to select the best database to use for each topic.

STANDARD 3

The first EAPIL test showed that students did very well with being able to evaluate information sources and deciding what would suit their needs, as noted from the scores, with an average of 92%. However, when they re-did the same test at the end of the spring semester, they did not do as well. This could have been due to the wording of the two questions, S3-5 and S3-10 (see Appendix D) and the ambiguity of the multiple choice answers the students could pick from. Powell and Ginier (2013) noticed the same problem when they administered their post-test. They stated that "a few students indicate *less* confidence in their information-seeking abilities on the post-test than on the pre-test" (p. 298). The authors believed that after receiving IL sessions, students "realize that finding high-quality information" is not as simple as they initially thought while taking the pre-test (Powell & Ginier, 2013, p. 298).

STANDARD 4

Similarly, questions in the other standards provided valuable information in defining gaps in the literacy program. Standard 4 responses showed similar results, averaging 82%. Traditionally, it has been difficult for librarians to measure standard 4 because they do not collect assignments, homework, and other assessments from students. However, an average increase to 86% was recorded on an EAPIL spring semester test, which shows that with more exposure and practical exercises, students would improve on their results. Indeed, students showed more confidence using scholarly publication and started developing critical thinking skills when evaluating information and determining its relevance and reliability.

STANDARD 5

This remained generally consistent. Questions 4, 5, 7 and 9 had better scores in the second semester but questions 1, 8 and 10 were unsatisfactory, which was frustrating to the instructors as these questions were based on general college knowledge. Table 1 below shows the students' scores on the EAPIL test for the fall and spring semesters.

RESEARCH QUESTION 3

R3: What were participants' perceptions of the IL content as part of the EAP curriculum?

Two instruments were used to answer this research question. First, the class was divided into three focus groups facilitated by the EAP faculty member, one information services librarian and one information services specialist. During the focus group discussions with the study participants, five major questions were asked. The first question dealt with students' overall perceptions about the IL course. It simply probed what they liked best about it. Conversely, the second question asked them what they liked the least about the course. The following question examined whether participants felt that the skills learned in the IL course could be applied in their everyday life, whereas the fourth question addressed the aspect of integrating IL skills in the EAP course. It examined whether students preferred having the skills taught jointly or separately. Finally, question five investigated students' attitudes towards the use of the flipped classroom modality and how they felt about viewing the material ahead of class on their own.

The results of the focus groups' responses yielded three consistent themes among the study participants. The most prevalent trends that emerged were information evaluation, citations, and search techniques.

Most of the participants expressed their concerns about the class schedule as the sessions were taking place by the end of the day, and students would be tired and easily distracted. Another concern was the impact of IL grades on their EAP final grade. Students felt that 10% was considerably high and asked to either decrease it to 5% or make the sessions optional.

Many participants did not see how they could apply IL skills to their everyday life; however, some of them acknowledged using website evaluation skills for online shopping. Participants also indicated that these skills helped them in their Biology and Science papers in general.

During focus groups, although most of the students stated that they did not like having the sessions compulsory, and many admitted that they did not check Canvas and did not read the material before class, most of them found the content to be useful and beneficial.

The second tool was a survey that included nine questions (see Appendix E). Students were asked about their level of confidence in using search techniques. They were also asked to list three skills they thought they developed during IL sessions and to share their concerns and suggestions to improve the sessions.

In Question 1, "Did the librarian make the purpose of the Information Literacy (IL) sessions clear to you?" 100% of the answers were positive.

Although IL sessions were integrated in the EAP online course, IL modules were easily identifiable and accessible to students. Module 1/Session 1 introduced students to IL skills and the expected outcomes (Fig. 1).

In question 2, students were asked to rate the overall value of IL sessions. While only seven students found IL sessions to be "Excellent," 10 out of 18 students rated the sessions as "Good". Only one student found the sessions to be "Fair." Class schedule (late in the day) during the fall semester might have had an impact on students' perception of IL sessions. Some students were concerned about being obliged to attend

Table 1
Results of the EAPIL tests.

Standard 1: *The information literate student determines the nature and extent of the information needed.*												
	S1–1	S1–2	S1–3	S1–4	S1–5	S1–6	S1–7	S1–8	S1–9	S1–10	S1 Average	n
Fall	100%	94%	83%	94%	84%	55%	73%	16%	100%	83%	78%	18
Spring	94%	100%	75%	100%	88%	56%	56%	44%	100%	88%	80%	17
Standard 2: *The information literate student accesses needed information effectively and efficiently.*												
	S2–1	S2–2	S2–3	S2–4	S2–5	S2–6	S2–7	S2–8	S2–9	S2–10	S2 Average	n
Fall	66%	83%	77%	55%	100%	100%	72%	61%	11%	94%	72%	18
Spring	94%	88%	100%	31%	100%	100%	81%	75%	81%	94%	84%	17
Standard 3: *The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.*												
	S3–1	S3–2	S3–3	S3–4	S3–5	S3–6	S3–7	S3–8	S3–9	S3–10	S3 Average	n
Fall	88%	100%	100%	100%	83%	94%	100%	94%	77%	88%	92%	18
Spring	100%	94%	100%	100%	44%	100%	100%	94%	81%	50%	86%	17
Standard 4: *The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.*												
	S4–1	S4–2	S4–3	S4–4	S4–5	S4–6	S4–7	S4–8	S4–9	S4–10	S4 Average	n
Fall	66%	100%	100%	72%	77%	100%	66%	88%	61%	94%	82%	18
Spring	44%	100%	100%	88%	94%	100%	94%	75%	75%	94%	86%	17
Standard 5: *The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.*												
	S5–1	S5–2	S5–3	S5–4	S5–5	S5–6	S5–7	S5–8	S5–9	S5–10	S5 Average	n
Fall	88%	100%	100%	55%	88%	77%	33%	94%	88%	73%	80%	18
Spring	69%	100%	100%	63%	100%	100%	50%	69%	100%	63%	81%	17

Note. n = number of students who participated in EAPIL tests. One student dropped the course for the spring semester. Cells in blue indicate scores equal or higher to 80%.

this course and the effect it had on their total grades. Other students asked to include more activities to make the sessions interactive as they found the class slow-paced and sometimes boring.

For questions 3 and 4, when students were asked to compare their research skills before and after attending IL sessions, most of them (15 out of 18) felt they were "Not Confident" or "Somewhat Confident" at the beginning of the fall semester. However, by the end of the fall semester, all students felt "Confident" and "Very Confident." Researchers were concerned that students might have chosen to respond positively to question four as they might be trying to please the instructors; however, in our case, the results of the EAPIL test in the spring semester demonstrated that students were indeed more confident using their research skills and became knowledgeable about the breadth of resources available to them. Students also showed some critical thinking skills when evaluating sources.

In question five, students were asked if they would use what they learned from the IL sessions. Students were able to choose multiple answers. This question provided insight into whether students believed they were learning skills that were transferable to real life situations. Fig. 2 shows that students indicated they could use the skills learned in their educational endeavors, especially skills on how to do research for a biology term paper (18), how to find sources for their essays (17), and how to cite when they write a lab report (14). Some respondents also indicated that these sessions would help them in some real life situations such as shopping for clothes and buying a car.

Question six asked students whether these sessions helped them improve their research skills. Most of the answers (17 out of 18) were positive.

Samples of the answers returned are as follows:

"*Yes. I was introduced to new research techniques and how to use databases.*"

"*Yes. Because it helps me a lot in avoiding plagiarism.*"

"*Yes. I did not know which websites to use or how to evaluate them before.*"

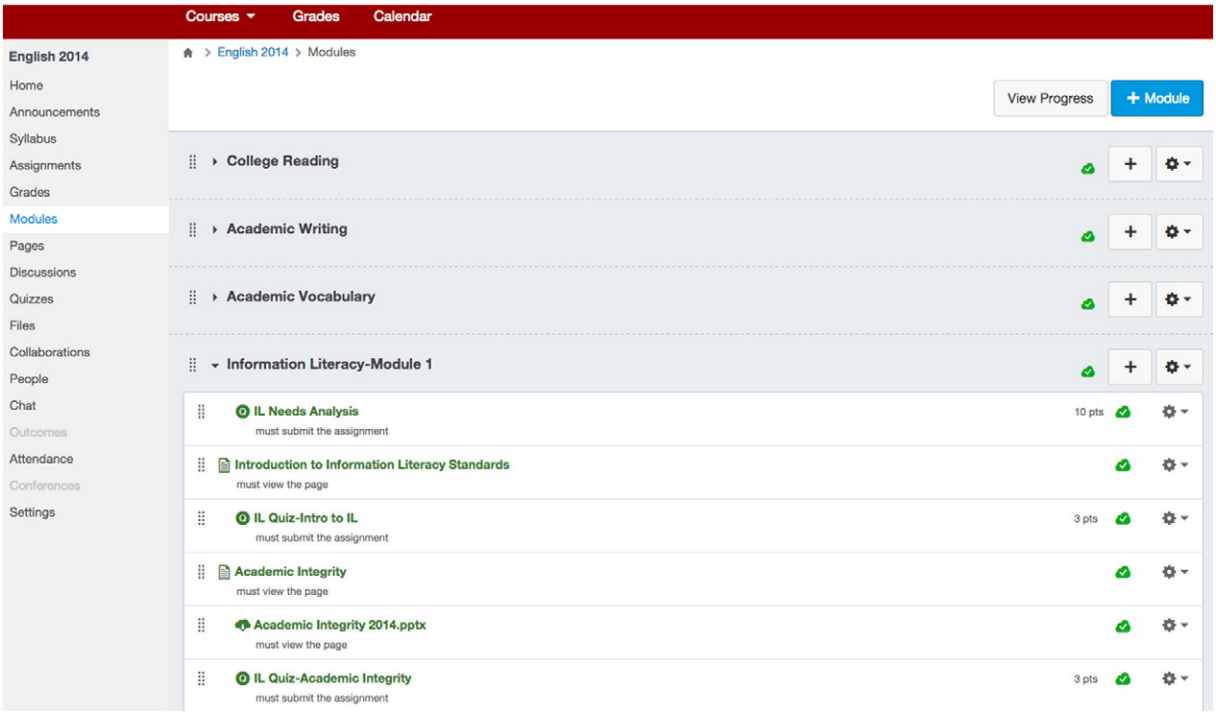

Fig. 1. Print screen of Canvas for the EAP online course for fall Semester 2014 showing the name of every module and the content of module 1.

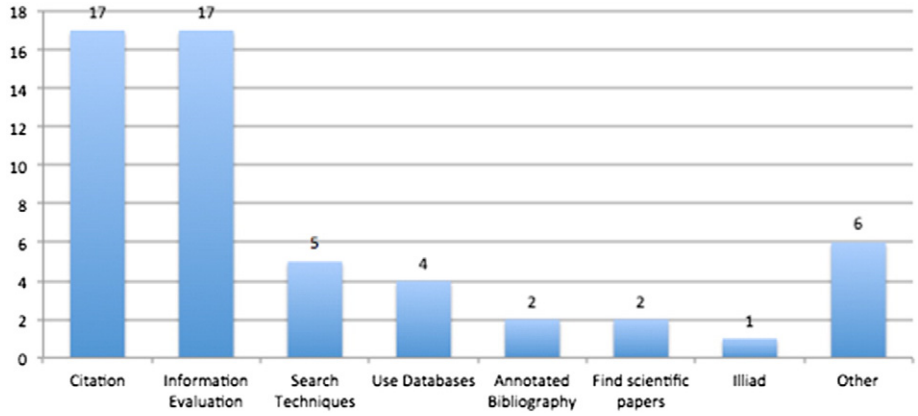

Fig. 2. Recurring trends in students' answers to question eight. The answers labeled "Other" were very general such as: "*well prepared search*", "*how to search for scholarly articles*", "*how to collect sources*", "*how to search*", "*how to make a proper search*", and "*how to search for information*".

"*Yes. I know which sources are credible and which keywords to use.*"

Positive answers to this question not only indicated to the researchers that student learning was progressing, but it also pointed out which areas students noticed the most growth. Only one student felt that he had not learned anything new because he was already familiar with the skills since he was repeating the course. In fact, this student's pre-test results were high and so were the EAPIL test results.

Question seven, "Was anything confusing or unclear during these sessions? Please explain." While most of the students (14 out of 18) did not find anything to be confusing or unclear, four students expressed some concerns. This could be explained by them reporting not having time to study the modules prior to class.

For question eight, students had to list three skills they learned from the sessions. The researchers decided to divide the answers into recurring trends. Fig. 2 shows the students' answers as per every trend.

Question eight responses yielded clear common topics among students. The most prevalent answer was the use of citations and evaluation of information, which reflects achievement of the goals of instruction as set by ACRL standards. Two other trends that emerged from participants' responses were the use of search techniques and database, which also re-emphasizes a fundamental principle of IL: *finding information*.

Question nine gathered some ideas on how to make IL sessions better. Most of the students preferred to have the sessions earlier in the day (seven students). Six out of 18 students suggested more practice and fun activities. One student suggested having the sessions as optional. Here are some of the answers:

"Time! 4.30!!! It would be more fruitful to have it earlier."

"Have it at an earlier time."

"By making the activities more fun."

"Make it optional and change the time of the class."

EVALUATION OF IL COURSE

Tools for measuring efficiency and effectiveness included:

- Instruction statistics: librarians tracked the number of instruction sessions provided, the number of students, the number of faculty that asked librarians to teach in-class instructional sessions, and any other appropriate criteria.
- Instructor self-evaluation: librarians regularly evaluated their own teaching effectiveness by examining the results of tests and through regular meetings to determine areas of improvement.
- Students' survey: at the conclusion of the first semester, students completed a survey on their perceptions of the effectiveness of IL instruction in their EAP course, the results of which were used to improve next semester's curriculum and instruction.
- With the data received from the evaluation process, DeLib ensures that the IL program addresses ACRL IL Competency Standards for Higher Education, DeLib's Strategic Plan and contributes to WCMC-Q's educational mission as a whole.

CONCLUSION

Before establishing a focused partnership between the ESL faculty and the librarians at our institution, IL instruction was irregular and sporadic. For example, librarians were invited to provide one-shot one-hour sessions that covered multiple topics in a short time without a focus on students' literacy needs. Different classes provided different instructions depending on faculty requirements. Moreover, sessions were mostly lecture-based and did not allot time for practice, assessment, or reflection, and student progress was not tracked from year to year. Instruction was not based on any rigorous standard due to the lack of a conceptual model that shaped a teaching approach based on a careful plan and directional goals. Consequently, this lack of focus resulted in inconsistency and non-uniformity in meeting the IL needs of ESL students.

To find a solution to these learning needs, the ESL faculty and librarians collaborated in the design of an integrated IL plan that adopted the ACRL's five standards. This partnership also helped create a logic model that consisted of inputs, outputs, activities, outcomes and impact of the IL sessions to provide a clear picture of the teaching goals and learning outcomes based on the ACRL IL standards. Faculty support is essential to ensure the success of this collaboration. For example, weekly classroom time was secured as part of the ESL course as well as a percentage of the overall grade was reserved for the IL assessments to maintain student engagement. Furthermore, with the institutional adoption of a new learning management system called Canvas, the IL facilitators were able to utilize the flipped classroom pedagogy through uploading short in-house instructional videos in order to increase students' self-regulated learning and encourage their preparedness.

As a result of these changes and collaborations, students were able to demonstrate transferable skills to the other courses in the program, such as biology, chemistry, global health seminar, and ESL writing. Faculty members teaching these courses expressed satisfaction with students because they were able to use citations correctly, evaluate research resources found on the web effectively, and write using sources more confidently. Students were also capable of using critical thinking strategies to evaluate concepts both in their academic career and their personal lives. Finally, the ESL faculty believed strongly that this was a successful partnership that resulted in students' readiness to tackle more complex material in the medical program thanks to their acquisition of IL skills. In fact, the ESL faculty has incorporated the IL component in his integrated reading/writing curriculum to become a vital component and indispensable part of the foundation program.

This study has demonstrated that a partnership between faculty and librarians was a success. Recently at our institution, basic sciences faculty have approached the librarians to integrate information literacy skills in the biology curriculum for the newly enrolled first year medical students. Due to the limited classroom time available, the flipped modality has become an added avenue to allow time for students to access IL materials at their own pace. To achieve similar results, the authors recommend that institutions of higher education encourage librarians to approach supportive faculty and seek ways to collaborate. A needs analysis should be administered in the beginning of the semester to identify the information literacy needs of students. Having a reliable, user-friendly learning management system (LMS) is fundamental to the success of such a partnership. There also needs to be ongoing communication between the faculty and librarians to monitor students' progress, evaluate the content and improve the delivery of the curriculum. Librarians need to diversify the pedagogical approaches in delivering the content of information literacy to accommodate various learning styles. At the conclusion of the program, faculty and librarians are advised to assess the effectiveness of the program by administering surveys to the students and conducting focus groups to seek students' feedback.

FUTURE DIRECTION

To keep this partnership innovative in the future, the faculty and IL facilitators plan to expand the topics and reexamine the skills covered in their curriculum to meet the needs of students due to impending changes in the medical program curriculum that will take place in fall 2016. To ensure the students' readiness to deal with this curricular change, the IL librarians would need to stay abreast of the changes to meet the needs of students early on in the foundation and premedical programs. In addition, based on the survey and focus groups' results, more integrative learning materials and interactive teaching activities would have to be developed, and more diversified assessments would need to be used on the LMS Canvas. Questions on the EAPIL test used to assess students' acquisition of IL skills would need to be updated and enhanced to reflect future curricular changes. Finally, we will need to make a strong case to make the IL course required and credit bearing. It is important to reiterate the support of faculty and the need for collaborative efforts to ensure a successful partnership with IL professionals in order to educate information literate global citizens.

APPENDICES

APPENDIX A

Table A.1
Curriculum mapping for foundation and premedical years.

Curriculum mapping foundation & premedical IL sessions 2011–2012				
Class	EAP	Writing Seminar 1	Writing Seminar 2	Biology
Year	Foundation	Pre Med 1	Pre Med 1	Pre Med 1
Learning objectives	1. Understand the need to cite references 2. Be able to use your topic to construct a search query 3. Be able to find material in PearlCat 4. Know how to search the Academic Search Premier and Web of Science databases 5. Have some idea of how to use RefWorks	1. Know what an annotated bibliography is 2. Be able to identify sources of high quality information 3. Use a variety of techniques for constructing information queries 4. Use DeLib resources to obtain full the text of articles 5. Generate a bibliography using RefWorks	1. Understand Google vs DeLib 2. Understand risks of research with Wikipedia 3. Become familiar with the DeLib Website; including Databases, Course Reserves & Course Support 4. Be able to place InterLibrary Loans (ILLiad) 5. Appreciate Copyright, cite cite cite!!	1. Understand why we need to cite 2. Be able to provide useful citations of books, chapters, encyclopedia entries, web pages/sites, and journal articles
Assessment/Clicker Questions	In-class exercises: 1. Conduct simple search in Academic Search Premier using topic of their choice 2. Enter references into RefWorks manually 3. Export references from RefWorks	In-class exercises: 1. Conduct simple search in WoS using topic of their choice 2. Enter references into RefWorks manually 3. Export references from RefWorks	In-class exercises: 1. Find “help” etc., on DeLib home page 2. Find a book on “writing” using Pearl Cat 3. Find a book on “English Literature” using the subject search in Pearl Cat 4. Use the Writing Seminar Subject guide to find an appropriate database	1. Students use templates to format some of their references in-class
ACRL Standards covered	Std One Std Two Std Three Std Four	Std One Std Two Std Three Std Four Std Five	Std One Std Two Std Three Std Four Std Five	Std Two Std Four Std Five
DeLib 101 Questions Applicable				Biology Information Lit Quiz and Assignment

Note. This table shows a sample of courses where librarians had been invited to provide instruction and the skills covered according to the ACRL IL Standards. Librarians used this table as a basis to determine the gaps in the DeLib IL program and design a new logic model that would take into consideration students and faculty needs as shown in Table A.2.

Table A.2
Logic model for foundation year.

Logic model foundation year 2014–2015				
Inputs	**Activities**	**Outputs**	**Outcomes**	**Impact**
Staff, tools & skills needed to accomplish activities	*Hands-on activities needed to reach the set outcomes*	*Assessment tools that show the evidence of the value of our activities*	*We expect the following changes to occur throughout the academic year (measurable through assessment)*	*We expect the following changes to occur in the next 5+ years (difficult to measure)*
Foundation team including Faculty and Librarians ITS support including Audio-Visual department & Educational Computing Services department. Access to LMS "Canvas" & online materials to build interactive content	Search DeLib discovery & be able to read a call number	Quiz	Be aware of key library services	Students will have developed basic IL skills that cover the need of premedical education & prepare students for their medical career. Students will also develop lifelong learning skills
	Create an account & use the interlibrary loan system & submit an ILL request	Assignment — submit an ILL request		
	Search general & specialized databases & understand the scope of each database	Quiz	Recognize & define an information need. Focus the search scope. Be able to use advanced search techniques & find needed information	
	Use advanced search option in databases & different search techniques: Booleans, truncation, phrasing	Assignment — include search string in search log		
	Focus your topic & brainstorm keywords & synonyms through mind mapping	Assignment — include list of keywords & synonyms in each search log		
	Use the search log to document search strategy	Assignment — submit a search log with every English essay	Document the search strategy & keep track of techniques & results	
	Primary & secondary sources of information	Quiz	Recognize different types of information sources	
	Understand academic integrity & adhere to academic ethical behavior	Quiz	Develop ethical behavior in academic life. Understand academic consequences on plagiarism	
	Understand plagiarism & its consequences	Quiz		
	Recognize the parts of a citation in MLA & APA styles	Quiz	Be able to cite sources properly. Utilize a bibliographic management tool to keep track of resources & documents used. Create annotated bibliographies.	
	Prepare a citation manually in MLA & APA styles	Assignment — include complete citations of relevant documents in search log		
	Export/import citation to RefWorks, manage citations & generate list of references	Assignment — submit a bibliographic list using RefWorks		
	Cite sources properly & create annotated bibliography	Assignment — submit an annotated bibliography in MLA style		
	Evaluate hoax websites & report/discuss findings	Assignment — compare & evaluate 3 websites	Evaluate information critically	
	Apply the CRAAP test to evaluate online information	Assignment — compare & evaluate 3 articles		
	Use Google Scholar & critically evaluate online content	Quiz	Use free online sources to find reliable information	
	Compare & determine scholarly vs. non-scholarly	Assignment — find 3 scholarly articles for English Essay	Understand scientific publications	

Note. This table shows the changes made to the DeLib IL program. Having a clear picture of the inputs/outputs, activities, outcomes and impact of the IL sessions helped in tailoring IL teaching towards defined goals based on the ACRL IL standards.
This logic model for foundation year will also serve as the basis to plan the logic model for premedical as well medical years and develop IL sessions that would reinforce, complement and expand students' information fluency.

APPENDIX B

Table B.1
Description of IL modules and sessions for the fall semester.

IL-Module 1/Session 1	Module content	Pts
Students were introduced to IL standards by ACRL and academic integrity	Introduction to IL Standards IL Quiz—Intro to IL Academic Integrity Readings Academic Integrity PowerPoint presentation IL Quiz—Academic Integrity What do students think of Academic Integrity?	 3 3

(continued on next page)

Table B.1 (*continued*)

IL-Module 1/Session 1	Module content	Pts
IL-Module 2/Session 2		
This module covered different types of information sources. It also described the search strategy and provided useful tools (such as a mind map) to generate ideas and (search log) to keep track of the search.	Types of Information Sources	
	Info Sources Reading	
	IL Quiz—Types of Information Sources	3
	How to plan your search strategy	
	IL—Words to watch for in essay questions	
	Tools to help you plan your search strategy-1—Mind Map	
	Tools to help you plan your search strategy-2—Search Log	
IL-Module 3/Session 3		
This module described the search techniques such as Boolean operators, filters, truncation, and phrasing. Two video tutorials on using DeLib Discovery and ProQuest database were created and posted in Canvas.	Search Techniques	
	IL Quiz—Search Techniques	4
	DeLib Discovery	
	IL Quiz—Discovery	4
	ProQuest—Introduction	
	IL—ProQuest Search	2
IL-Module 4/Session 4		
Module 4 covered plagiarism, citation and bibliography using MLA style	IL-Search Log-Harry Potter	5
	What is Plagiarism?	
	IL Quiz—Plagiarism	3
	Different parts of a citation	
	Why do you need to cite your sources?	
	Example of a book citation in MLA style	
	Example of an article citation from online journal in MLA style	
	When to cite your sources?	
	What is the difference between in-text citation and bibliography?	
	Citation Practice Drag & Drop	
	IL Quiz—Citation & Bibliography	3
IL-Module 5/Session 5		
In Module 5, students were introduced to annotated bibliography in MLA style	Process of creating an Annotated Bibliography	
	Annotated Bibliography	
	Example of an Annotated Bibliography of a Book in MLA Style	
	IL Quiz—Annotated Bibliography	3
	IL Annotated Bibliography	5
IL-Module 6/Session 6		
This module described where to find background information and how to recognize popular, scholarly and peer-reviewed journals	Find Background Information	
	IL Quiz—Research Basics	5
	Popular, Scholarly & Peer-Reviewed	
	Scholarly, Or Not?	
	IL Quiz-Popular, Scholarly & Peer Reviewed	6
IL-Module 7/Session 7		
A video tutorial on using Web of Science and Scopus databases was published in this module. Evaluating sources of information and using CRAAP test* for web sources was another outcome taught in this module.	IL—Web of Science + Scopus	
	IL—Evaluating Sources Checklist	
	IL Quiz—Advanced Search	3
	IL Websites Evaluation	3
IL-Module 8/Session 8		
This last module for the fall semester covered Google Scholar and introduced students to interlibrary loan service	Google Scholar	
	IL Quiz—Google Scholar	3
	What is ILL?	
	How to create an account for ILLiad?	
	IL ILLiad	2
IL-Session 9		
There was no module for session nine as librarians found that evaluating web sources was challenging for students, and half of them did not submit the assignment on time. It was decided to use session 9 to do more in-class web sources evaluation.	Website evaluation: students were divided into groups of three, and each group had to evaluate a website using CRAAP test* and write a summary. A discussion took place at the end of the class where students had then to present their findings.	

Note. Pts = Points for every quiz or assignment.
*CRAAP test is an acronym referring to the general criteria used to evaluate resources: Currency, Relevance, Authority, Accuracy and Purpose. It was developed by the Meriam Library at California State University, Chico.

Table B.2
Description of IL modules and sessions for the spring semester

IL-Module 1/Session 1	Module content	Pts
This module presented Library of Congress classification scheme. Librarians created and uploaded a video tutorial on using Scopus database.	How to find a print book in the Reading Room?	
	How to read a call number?	
	Time to Play!	
	Scopus	
	IL Practice Quiz 1	
	IL Quiz 1	5
	ProQuest vs. Scopus	5

Table B.2 (*continued*)

IL-Module 1/Session 1	Module content	Pts
IL-Module 2/Session 2		
Primary and secondary sources of information were covered in this module	Primary vs. secondary sources Primary sources of information Secondary sources of information Research companion video IL Practice Quiz—primary vs. secondary IL Quiz 2	5
IL-Module 3/Session 3		
Module 3 revisited citation and covered APA style	APA (American Psychological Association) style How to cite in APA style? Example of a book citation in APA style Example of a journal article citation in APA style Example of a website citation in APA style Why do you need to cite your sources? When to cite your sources? What is the difference between in-text citation & bibliography? Purdue–APA style formatting IL Practice Quiz—APA citation IL Quiz 3	5
IL-Module 4/Session 4		
In this module, students were given more activities for APA, and a general introduction to citation management tool "RefWorks"	APA practice IL—In-text Citation Quiz RefWorks ProQuest & RefWorks Create a bibliography using RefWorks Example of a book citation in MLA style IL Quiz 4 IL Bibliography and Search Log–Gender Roles	5 5 8
IL-Module 5/Session 5		
This session was divided into 2 parts. In part 1, a Q&A session took place where librarians did a quick review of IL modules for the fall and spring semesters and answered students questions. In part 2, students had to take the second EAPIL test.	Q & A EAPIL Test — spring semester	

Note. Pts = points for every quiz or assignment.

APPENDIX C

Needs Analysis Results.

Q1: When doing a search, deciding whether or not your original information need has been satisfied requires:
95% of your students correctly answered this question.

Answer 1: a. Refining of the search strategy used	No responses
Answer 2: b. Management of the information found	No responses
Answer 3: c. Evaluation of the information found	18 responses
Answer 4: d. I don't know	No responses

Q2: You are looking up information about a specific type of diabetes in a textbook in the library. The best and fastest way to find information in a textbook is:
100% of your students correctly answered this question.

Answer 1: a. Ask your professor	No responses
Answer 2: b. Searching page by page	No responses
Answer 3: c. Looking in the index of the book	18 responses
Answer 4: d. None of the above	No responses
Answer 5: e. I don't know	No responses

Q3: An abstract is:
89% of your students correctly answered this question.

Answer 1: a. Summary of an article	16 responses
Answer 2: b. Quote from book	One response
Answer 3: c. All of the above	One response
Answer 4: d. None of the above	No responses
Answer 5: e. I don't know	No responses

Q4: Which of the following topics would require current information:
100% of your students correctly answered this question.

Answer 1: a. World War II	No responses
Answer 2: b. Health statistics on breast cancer incidents in Qatar	18 responses
Answer 3: c. History of the Pyramids	No responses
Answer 4: d. I don't know	No responses

Q5: Which of the following searches would retrieve the most results in an online database?
42% of your students correctly answered this question.

Answer 1: a. Obesity AND overweight	7 responses
Answer 2: b. Obesity OR overweight	8 responses
Answer 3: c. Obesity AND overweight NOT overeating	2 responses
Answer 4: d. I don't know	One response

Q6: What section of a journal article typically summarizes the main ideas and findings of the article?
100% of your students correctly answered this question.

Answer 1: a. The text of the article	No responses
Answer 2: b. The person who wrote it	No responses
Answer 3: c. The abstract	18 responses
Answer 4: d. The bibliography	No responses
Answer 5: e. I don't know	No responses

Q7: The following citation,
Liebler, R. (2010). Action and ethics in education. *Academic Ethics*, *8*(2), 153–160 is for:
32% of your students correctly answered this question.

Answer 1: a. Website	No responses
Answer 2: b. Journal article	6 responses
Answer 3: c. Journal	One response
Answer 4: d. Book	10 responses
Answer 5: e. I don't know	One response

Q8: Plagiarism is:
100% of your students correctly answered this question.

Answer 1: a. Not citing your sources of information	18 responses
Answer 2: b. Abstract	No responses
Answer 3: c. Citation style format	No response
Answer 4: d. I don't know	No responses

Q9: When evaluating information resources, you should consider: (please select all answers that apply).
21% of your students correctly answered this question.

Answer 1: a. Author's credentials	14 responses
Answer 2: b. Accuracy of information	15 responses
Answer 3: c. Information currency	8 responses
Answer 4: d. None of the above	No responses
Answer 5: e. I don't know	2 responses

Q10: You can copy and paste image into your own work as long as: (please select all answers that apply).
32% of your students correctly answered this question.

Answer 1: a. You add proper citation	16 responses
Answer 2: b. You found it on the web	No responses
Answer 3: c. You found it in an explicitly copyright-free source	10 responses
Answer 4: d. I don't know	No responses

APPENDIX D

EAPIL Test Questions.
STANDARD 1 QUESTIONS: *determines the nature and extent of the information needed.*
S1-1 'Discovery', DeLib's catalog, contains all of the following except:
Answer 1: Books.
Answer 2: Scholarly articles.
Answer 3: eJournals.
Answer 4: Laser Disk.
S1-2 If a book that you would like to read is not available in DeLib, what is the best way to obtain the book?
Answer 1: Sign up for an account in RefWorks.
Answer 2: Book a plane ticket to the US to go to the library in New York.
Answer 3: Ask the professor if you can be excused from the assignment.
Answer 4: Put in a request through DeLib's ILLiad service.
S1-3 You have just received a research project from your professor and are unfamiliar with the subject. To begin, where can you quickly find background information on this topic?
Answer 1: An encyclopedia.
Answer 2: A dictionary.
Answer 3: A credible website.
Answer 4: All of the above.

S1-4 You need to research information about X-rays. After some initial searching, you decide to focus your topic on the side effects of X-rays. Therefore, you do the following:

Answer 1: Add publication date as a limit.

Answer 2: Refine your keywords to get more focused results.

Answer 3: Check with your friends to see what they are doing.

Answer 4: Search for synonyms for X-rays.

S1-5 How can you find a specific database in DeLib? (Choose All That Apply).

Answer 1: Type the database name in the DeLib search box.

Answer 2: Click on the list of DeLib Databases and browse the list.

Answer 3: Search ILLiad.

Answer 4: All of the above.

S1-6 In DeLib's 'Discovery', you can search for:

Answer 1: Items in all formats (journals, books, DVDs, etc).

Answer 2: Electronic journals only.

Answer 3: Print and electronic books only.

Answer 4: Student information.

S1-7 When requesting a book by ILL you will be able to attain items from: (Choose All That Apply).

Answer 1: Other university libraries in Education City.

Answer 2: Cornell University Library (Ithaca).

Answer 3: Hamad Medical Center.

Answer 4: Qatar University.

S1-8 Your friend, Abdul, went for a walk yesterday and took a photo of a flower. You decide that you would like to include it in the paper you are writing for your Biology course on herbs and spices. Is the picture a Primary or Secondary source?

Answer 1: Primary.

Answer 2: Secondary.

S1-9 You can access DeLib's resources from anywhere with:

Answer 1: A WCMC-Q username & password.

Answer 2: A Qatar driver's license.

Answer 3: A passport.

Answer 4: A Qatar residence permit.

S1-10 After conducting a literature search, deciding whether or not your information need has been satisfied requires:

Answer 1: Refining the search strategy.

Answer 2: Management of the information found.

Answer 3: Evaluation of the information found.

Answer 4: None of the above.

STANDARD 2 QUESTIONS: *accesses needed information effectively and efficiently.*

S2-1 You conduct an interview with an athlete about the use of steroids in football and wish to use a transcript of the interview in your assignment. This would be considered a secondary source of information:

Answer 1: True.

Answer 2: False.

S2-2 You are working on the following research topic: Diabetes in Qatar, and begin your search with the following search strategy: Diabetes AND Qatar.

However, you find many articles and realize that you only want to concentrate on diabetes in children in Qatar. Which search string will provide the most effective set of results?

Answer 1: Diabetes AND Qatar AND Children.

Answer 2: Diabetes AND Qatar AND (Child* OR kids OR "young adults").

Answer 3: Diabetes and Qatar and kids.

Answer 4: Diabetes Qatar Children.

S2-3 Maria has gathered many citations for her research paper and would like to save them in case she does a similar paper in the future. Which software that is available through DeLib would be her best choice?

Answer 1: Database.

Answer 2: Grab-It.

Answer 3: RefWorks.

Answer 4: Rosetta Stone.

S2-4 A search string used in one database can always be copied straight into another database.

Answer 1: True.

Answer 2: False.

S2-5 Words with identical or very similar meanings are called:

Answer 1: synonyms.

Answer 2: Antonyms.

Answer 3: Interesting.

Answer 4: Allusions.

S2-6 Information found on the Internet is always trustworthy.

Answer 1: True.

Answer 2: False.

S2-7 If you are looking for scholarly, scientific articles, the best database to choose is:
Answer 1: ProQuest.
Answer 2: Scopus.
Answer 3: Humanities International Index.
Answer 4: Rosetta Stone.
S2-8 DeLib's 'Discovery' will not help you find:
Answer 1: The book "The Great Gatsby".
Answer 2: DVD of "House".
Answer 3: The database "Web of Science".
Answer 4: The social media "Facebook".
S2-9 All print books in the Reading Room are arranged by:
Answer 1: Author.
Answer 2: Color.
Answer 3: Call number.
Answer 4: ISBN.
S2-10 You are working on a research paper on the effects of mobile phones on brain health in Qatar. The key concepts from this research assignment are:
Answer 1: Handsets, health.
Answer 2: Mobile phone, brain, Qatar.
Answer 3: Mobile, Qatar, work.
Answer 4: Health, Qatar.

STANDARD 3 QUESTIONS: *evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.*
S3-1 Summarizing concepts in your research topic or question can help you find keywords to be used in your search.
Answer 1: True.
Answer 2: False.
S3-2 How would you incorporate more keywords into your search to get more focused results?
Answer 1: Use AND.
Answer 2: Use OR.
S3-3 What section of a journal article summarizes its main ideas and findings?
Answer 1: The list of authors.
Answer 2: The bibliography.
Answer 3: The main text of the article.
Answer 4: The abstract.
S3-4 Which of the following are important when evaluating a journal article?
Answer 1: The year of publication.
Answer 2: Peer reviewed or not.
Answer 3: Author credentials.
Answer 4: All of the above.
S3-5 Ahmed has started a research project on male obesity in Qatar. Which of the following criteria would be most important to him when evaluating journal articles?
Answer 1: Geographic area that the research was compiled from.
Answer 2: Where the researcher works.
Answer 3: How many times the article has been cited.
Answer 4: Length of the article.
S3-6 After conducting a search on narcolepsy, Nina found that there were too many results to work with. Which of the following strategies could reduce the number of results?
Answer 1: Filter search to include only scholarly articles.
Answer 2: Revise the general search to a focused search.
Answer 3: Filter search to include publications from the past 5 years only.
Answer 4: All of the above.
S3-7 You need to research if a particular drug therapy is the best course of action for a condition. What would be the most effective and comprehensive course of action?
Answer 1: Use the information from the first article you find.
Answer 2: Examine articles that both advocate and detract from this course of treatment and evaluate their findings.
Answer 3: Find two articles from "New Treatment Journal" and use the most recent one.
Answer 4: Find two articles from "New Treatment Journal" and use the oldest one.
S3-8 You need to find the most recent information on a drug that has just received governmental approval. What type of source is most likely to give you reliable and up-to-date information?
Answer 1: An electronic book.
Answer 2: A textbook.
Answer 3: A pharmacology database.
Answer 4: A pharmacology subject guide.
S3-9 Which source is most likely to contain bias on research for a new drug that cures multiple forms of cancer?
Answer 1: The New England Journal of Medicine.
Answer 2: The new drugs' company website.

Answer 3: Introduction to Cancer Drug Therapies.
Answer 4: The University of Virginia Medical Journal.

S3-10 Your initial research has introduced you to multiple theories on how to treat anaphylaxis precipitated by insect venom. What might you want to do at this point in your research?

Answer 1: Investigate further by using the new concepts within your search string.
Answer 2: Discard all of your previous research.
Answer 3: Save everything to RefWorks.
Answer 4: None of the above.

STANDARD 4 QUESTIONS: *uses information effectively to accomplish a specific purpose.*

S4-1 Reviewing how you write an essay should:
Answer 1: Occur after you've received a grade.
Answer 2: Occur while you're in the process of writing it.
Answer 3: Occur prior to writing.
Answer 4: None of the above.

S4-2 You have found a 3-page section of a paper that you think perfectly summarizes much of what you want to say in your 5-page essay. You should:

Answer 1: Quote it all and just write 2 pages agreeing with it.
Answer 2: Summarize it in your own words and cite it.
Answer 3: Cut and paste it into your essay.
Answer 4: Summarize it in your own words.

S4-3 Trends in data are usually best communicated with:
Answer 1: Tables.
Answer 2: Footnotes.
Answer 3: Charts.
Answer 4: Cartoons.

S4-4 The most effective presentation model for displaying the findings of a written report to a large group, utilizing MS PowerPoint, is… ?
Answer 1: Use a PowerPoint with only a few points on many slides.
Answer 2: Use a PowerPoint with lots of information on as few slides as possible.
Answer 3: Display a copy of the original written report on the screen**.**
Answer 4: Use a PowerPoint with only a few points on as few slides as possible.

S4-5 The bullet-point format you have used for a class presentation will be fine for your essay on the same topic.
Answer 1: True.
Answer 2: False.

S4-6 You discover that some of your lab results contradict those reported in a published paper. You should:
Answer 1: Mention the contradiction in your report and try to explain or draw conclusions from it.
Answer 2: Use the results from the published paper as yours must be wrong.
Answer 3: Do not mention the discrepancy in your report.
Answer 4: Change your results to look like the published ones.

S4-7 You want to describe the differences in bacterial counts of water from five different locations. After determining the bacterial count of 1000 water samples from each location, it is best to report:

Answer 1: The average count and statistical variation for each location.
Answer 2: A general description of the results, not mentioning numbers.
Answer 3: All 5000 results according to location with no statistical treatment.
Answer 4: The average count for each location.

S4-8 Many databases have a feature that allows you to save a "search history". Why would you use this?
Answer 1: To avoid repeating searches already done.
Answer 2: To remind yourself of concepts you have already searched for.
Answer 3: To help determine which searches were the most successful.
Answer 4: All of the above.

S4-9 What is the most effective way to describe the steps involved in a chemical reaction?
Answer 1: Detailed verbal description.
Answer 2: Series of diagrams.
Answer 3: Bell curve.
Answer 4: Randomized Control Trial.

S4-10 Sa'ad wants to produce some charts and graphs for a written lab report. To do this he will use:
Answer 1: A ruler and pencil.
Answer 2: Microsoft Office Suite: PowerPoint, Excel and Word.
Answer 3: Adobe Writer.
Answer 4: Adobe Photoshop.

STANDARD 5 QUESTIONS: *understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.*

S5-1 Which of the following resources are not paid for by WCMC-Q?
Answer 1: Web of Science.
Answer 2: MLA International Bibliography.

Answer 3: Wikipedia.
Answer 4: ProQuest.
S5-2 If you use a picture from the Internet in your paper, you need to cite where it came from:
Answer 1: True.
Answer 2: False.
S5-3 You are doing a presentation for a class. Which of the following do you need to cite?
Answer 1: A picture.
Answer 2: A poem.
Answer 3: An indirect quote, or paraphrase.
Answer 4: All of the above.
S5-4 Making photocopies of an article for your classmates is acceptable under copyright law.
Answer 1: True.
Answer 2: False.
S5-5 DeLib's resources are only available on campus.
Answer 1: True.
Answer 2: False.
S5-6 Which of the following resources are designed to help you cite correctly?
Answer 1: RefWorks.
Answer 2: ILLiad.
Answer 3: Rosetta Stone.
Answer 4: Discovery.
S5-7 The MLA citation style is more commonly used for:
Answer 1: Humanities.
Answer 2: Social Sciences.
Answer 3: Medicine.
Answer 4: Anthropology.
S5-8 When you are off campus, what can be accessed with your WCMC-Q ID & password?
Answer 1: DeLib's print & electronic resources.
Answer 2: Reading Room printers.
Answer 3: DeLib's electronic resources.
Answer 4: None of the above.
S5-9 You have found an electronic book in DeLib's 'Discovery'. As you are leaving the country right away, you decide to print out the book so you can read it on the plane. It isn't a very big book, only 20 pages. This is legal because you are leaving the country.
Answer 1: True.
Answer 2: False.
S5-10 Which of the following are freely available on the Internet? (Check All That Apply).
Answer 1: ProQuest.
Answer 2: Web of Science.
Answer 3: Supreme Council of Health Website.
Answer 4: Google Scholar.

APPENDIX E

Survey Results.

1. Did the librarian make the purpose of the Information Literacy (IL) sessions clear to you?

Yes	18 students
No	0

2. Rate the overall value of IL sessions:

Poor	0
Fair	1
Good	10
Excellent	7

3. How do you describe your research skills **before** attending IL sessions?

Not confident	8
Somewhat confident	7
Confident	2
Very confident	1

4. How do you describe your research skills **now**?

Not confident	0
Somewhat confident	0
Confident	8
Very confident	10

5. How will you use what you learned from these sessions? **(Check all that apply)**

Biology research paper	18	Lab report	14
Buying a car	5	Essays	17
Like a post on Facebook	1	Traveling	7
Clothes shopping	12	Painting a picture	1

6. Have these sessions helped you improve your research skills? Please explain

Yes. I was introduced to new research techniques and how to use databases.
Yes. I have been using scientific databases.
No. Because I am already familiar with all the skills since I have taken them before.
Yes. Because it helps me a lot avoiding plagiarism.
Yes. I did not know which websites to use or how to evaluate them before.
Yes. I know which sources are credible and which keywords to use.
Yes. Because it provided information and taught things that I did not know before, ex: annotated bibliography.
Yes. Now, not only do I know how to use databases, I know how to limit my search and by doing so research isn't as time consuming as it was before.
Yes. I learned how to differentiate between resources, how to use them and how to evaluate them.
Yes. 1. Determine the reliable source from what is not. 2. Cite in appropriate way.
Yes. Now I know how to find what I exactly need by using certain search techniques.
Yes. I have learnt to differentiate between scholarly/peer-reviewed articles from less valid articles.
Yes. Because I learned how to research for desired info. From credible websites, while I didn't know how to do that before.
Yes. I now know how to use database and other resources available in Cornell. I know how to cite resources and evaluate websites.
Yes. Because I know how to cite websites and books. Also, I learnt how to evaluate websites and articles to see if they are reliable or not.
Yes. Because now I can choose appropriate resources that are reliable and can be trusted.
Yes. I learned how to cite and how to look for information in any database.
Yes. I learned how to look for the information that I need for my assignments, how to evaluate it, how to use it, and how to cite it.

7. Was anything confusing or unclear during these sessions? Please explain

No
No. If anything was confusing instructors helped me.
Not really, the instructors were helpful in answering and clearing some misunderstandings.
No, because I always ask the librarians when I need anything.
No.
Most things are very well explained in the modules, and things we learn from modules apply on the activities in class.
No. Nothing was confusing. The lecturers were good at explaining the main points.
No :)
No. Everything was well explained.
No. Everything was clearly presented. But the activities might be a bit vague as instructions
weren't written and I didn't understand some of the terminology used.
Some activities we did in class we did not know how to do example: citing resources and the order in which names should be in (author, publisher, article…).
Unsure, some of the sessions I had no idea what was going on and some of them I was pretty sure what was the subject.
Yes, there were some materials that I couldn't understand when I read them on Canvas but when we applied them in class I sort of understood what was happening.
No.
We still don't know about ALL what the library provides.

8. List 3 things you learned from these sessions:

1. Boolean, truncation. 2. How to request through ILLiad. 3. Annotated bibliography.
1. Choose right sources. 2. Proper works cited. 3. Well prepared research.
1. Citing. 2. Database. 3. Reliability of source.
1. How to cite my work. 2. How to make a proper research. 3. How to evaluate the sources.
1. Evaluating websites. 2. How to research for a scientific paper. 3. How to cite sources.
1. How to use WCMC-Q resources. 2. How to evaluate websites. 3. Citations.
1. How to cite. 2. How to evaluate websites & resources. 3. How to write an annotated bibliography.
1. How to search. 2. How to evaluate websites. 3. How to cite!
1. How to search (keywords) in the database. 2. How to evaluate the information. 3. How to cite my resources.
1. Differentiate between a reliable source from not. 2. Cite properly. 3. Narrow the research choices.
1. Search techniques. 2. Website evaluation. 3. MLA citation.
1. Evaluation of journals/articles/websites. 2. How to search for scholarly articles. 3. How to cite.
1. Citation. 2. How to research for information. 3. Evaluating websites.
1. Citing resources. 2. Evaluating websites. 3. Using databases-limiting research.
1. Cite. 2. Evaluate. 3. Use databases.
1. How to collect resources. 2. How to cite. 3. How to evaluate websites.
1. Citation. 2. Evaluation of a website. 3. Looking for an information for a scientific paper.

9. How can we make the Information Literacy class better for future students?

Have shorter group discussions.
Giving students more exercises during class.
Make it optional and change the time of the class.

I think it should be combined with English class.
Having these sessions earlier in the day instead of 3:30.
Focus more on reviewing modules rather than the activities.
Having them at early times & having to read the modules or take quizzes in-class/other things discussed with you today :) Thank you.
Just the timing was inconvenient.
By adding more practical practice during the sessions.
Time! 4.30!!! It would be more fruitful to have it earlier.
More movement and exercises.
By making the class more active.
Less boring, shorter, more movement activities that involve movement. No modules to read at home.
Have it at an earlier time.
Change the timing, because if the session was in the evening the student would be already tired.
By making the activities more fun.
Change the timing & more physical activities.
By not having a lot of burden and unaffected grades. Also ensuring that students are learning.

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